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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,926	10/27/2003	Guenter W. Brune	DCI-6CIP1D3	5085

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EXAMINER	
SMITH, MATTHEW J	

ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/694,926	BRUNE ET AL.	
	Examiner	Art Unit	
	Matthew J. Smith	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-50 and 71* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25-42,48-50 and 71* is/are rejected.

7)☒ Claim(s) *43-47* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

EA

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 25, 26, 28-35, 37-42, 48-50, and 71 are rejected under 35 U.S.C. 102(b) as being anticipated by Rorden et al. (4710708).

Rorden et al. disclose a system, in figure 7, for tracking the position of a boring tool (col. 24, line 68) including a device T for transmitting an electromagnetic locating signal, an above ground arrangement R for receiving the electromagnetic locating signal for use in establishing the position of the boring tool and a method comprising the steps of: providing at least two above ground detectors R1, R2 as part of the arrangement, each of which is configured for receiving the locating signal; locating the detectors at initial positions within a dipole range of the electromagnetic locating signal (note Abstract) transmitted from the boring tool at a first, start position; receiving the electromagnetic locating signal using the detectors to produce a first set of electromagnetic data; moving the boring tool to a second position; receiving the electromagnetic locating signal using the detectors with the boring tool at the second position to produce a second set of electromagnetic data; determining absolute positions of the detectors within the region using certain information including the first and second sets of electromagnetic data in a predetermined way; the detectors include

tilt sensors, or tiltmeter (col. 5, line 7) for measuring a tilt orientation of each detector such that the tilt orientation of each detector forms part of the certain information; the electromagnetic locating signal includes a known signal strength (1-1000 Hz) which forms part of the certain information; measuring a distance between the first and second positions of the boring tool and using the distance as part of the certain information in a way which improves accuracy (best fit, col. 20, line 43) in determining the absolute positions of the detectors in the region; the distance used in a way which overdetermines the absolute receiver positions so as to permit the use of a least square error technique (col. 9, line 64); the step of receiving the electromagnetic locating signal in the predetermined way further includes producing one or more additional subsets (columns 14+) of the electromagnetic data at one or more additional positions of the boring tool, the additional subsets of electromagnetic data being used in determining the absolute positions of the detectors as part of the overall electromagnetic data; the determination of the absolute positions of the detectors includes an overall certain number of known values and an overall certain number of unknown values (columns 19+) and measurements taken at the second position and at each additional position of the boring tool contribute at least one more additional known value to the overall certain number of known values such that the number of overall certain number of known values can be increased relative to the overall number of unknown values; taking measurements at a sufficient number of positions such that the overall certain number of known values is equal to or greater than the overall certain number of unknown values so as to use only electromagnetic data in determining the absolute positions of

the detectors (column 13 and 14); determining the absolute positions of the detectors includes the step of using the additional known values in place of at least portions of the certain information (col. 26, lines 60-68; col. 27; col. 28, lines 1-22); the system includes a drill rig (figure 7) having an extendable drill string attached to the boring tool such that movement of the boring tool is accomplished by extending or retracting the drill string; and configuring a detector to transmit the locating signal as a dipole signal (note Abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 27 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rorden et al. in view of Flowerdew et al. (4712812).

Rorden et al. disclose a boring tool locating system having an electromagnetic dipole signal transmitter and two above ground receivers but not a pitch sensor such that the pitch angle of the boring tool forms part of certain information.

Flowerdew et al. describe measuring pitch of a boring tool in a directional drilling system to assist in guidance of the boring tool.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to measure pitch of the boring tool, as described by Flowerdew et al. in order to increase accuracy.

Allowable Subject Matter

Claims 43-47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments, see page 7, filed 2 March 2005, with respect to claims 25 and 40 have been fully considered and are persuasive. The 35 U.S.C. 102 and 103 rejections of claims 25 and 40 have been withdrawn. The rejection in view of Rorden et al. is considered pertinent since the two detector-one transmitter system using electromagnetic sensors (note col. 23, lines 64), and dipole field transmitting and receiving and subsequent analysis is anticipated.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Smith whose telephone number is 571-272-7034. The examiner can normally be reached on T-F, 9-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Bagnell
Supervisory Patent Examiner
Art Unit 3672

MJS MJS
20 May 2005